

## Nigrostriatal Pathway (Dopaminergic)



PLAY PICMONIC

### Dopamine Pathway

#### Doberman Pathway

The nigrostriatal pathway is one of the four dopaminergic pathways involved in the release of dopamine.

#### Location

##### Substantia Nigra

##### Substantial Knight

The nigrostriatal pathway begins at the substantia nigra of the midbrain.

##### Striatum

##### Striped-ribbon

The nigrostriatal pathway ends at the striatum, specifically involving the putamen and caudate nucleus of the basal ganglia.

#### Characteristic

##### Motor Function

##### Motor

The nigrostriatal pathway is responsible for controlling the motor functioning of the body.

##### Direct Pathway

##### Direct-route

The nigrostriatal pathway involves the basal ganglia, which is responsible for both the direct and indirect pathways of movement. The direct (excitatory) pathway begins in the cortex and *excites* the striatum (D1 receptor). The striatum then *inhibits* the substantia nigra. Normally, the substantia nigra *inhibits* excitatory structures. However, if the substantia nigra is inhibited, the thalamus is free to send **excitatory** input to the motor cortex, which leads to **increased** movement. Thus, the overall input of the direct pathway is **excitatory**.

##### Indirect Pathway

##### Indirect-route

The nigrostriatal pathway involves the basal ganglia, which is responsible for both the direct and indirect pathways of movement. The first indirect (inhibitory) pathway begins in the cortex and *excites* the striatum. The striatum then *inhibits* the subthalamic nucleus, which sends excitatory signals to

the substantia nigra. The substantia nigra is then free to *inhibit* the thalamus, an excitatory structure. With the thalamus inhibited, **excitatory** signals cannot be sent to the motor cortex, which leads to **decreased** movement. Thus, the overall input of the indirect pathway is **inhibitory**. However, the second pathway involves the striatum stimulating the substantia nigra, acting on D2 receptors, which then *inhibits* the subthalamic nucleus. The inhibition of the subthalamic nucleus then allows **excitatory** signals from the thalamus to proceed to the motor cortex, resulting in **increased** movement.

## Defect

### Extrapyramidal Symptoms

#### X-Pyramid

If there is a defect of the nigrostriatal pathway, it leads to the presentation of extrapyramidal symptoms. In the case of inhibition, this can involve a type of pseudoparkinsonism. If instead stimulated, this can involve chorea.